



IEC 60255-27

Edition 3.0 2023-02  
COMMENTED VERSION

# INTERNATIONAL STANDARD



**Measuring relays and protection equipment –  
Part 27: Product safety requirements**



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**Measuring relays and protection equipment –  
Part 27: Product safety requirements**

INTERNATIONAL  
ELECTROTECHNICAL  
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**MEASURING RELAYS AND PROTECTION EQUIPMENT –****Part 27: Product safety requirements**

## FOREWORD

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**This commented version (CMV) of the official standard IEC 60255-27:2023 edition 3.0 allows the user to identify the changes made to the previous IEC 60255-27:2013 edition 2.0. Furthermore, comments from IEC TC 95 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.**

**A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.**

**This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.**

IEC 60255-27 has been prepared by IEC technical committee 95: Measuring relays and protection equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) conflicting statements removed;
- b) scope clarified and statement added that all clauses of the standard are required not just type tests;
- c) terminology, definitions and documentation requirements aligned with IEC 60255-1;
- d) alignment with IEC 61010-1, e.g. HLV definitions;
- e) ingress protection clarified;
- f) dielectric and impulse tests added to mechanical and environmental test requirements;
- g) insulation resistance requirements updated for alignment with other product safety standards;
- h) sample testing removed;
- i) short time limiting thermal overload added;
- j) resistance to mechanical stress added;
- k) low-power voltage and current transformer ports added;
- l) Annex C tables updated to align with base standards;
- m) Annex D voltage dependent resistors and radio transmitters added;
- n) Annex G for risk assessment added.

The text of this International Standard is based on the following documents:

Draft	Report on voting
95/516/FDIS	95/526/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

A list of all parts in the IEC 60255 series, published under the general title *Measuring relays and protection equipment*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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## INTRODUCTION

~~In order to demonstrate that the equipment is safe, it was previously necessary to refer to general safety standards such as IEC 61010-1 in addition to IEC 60664-1.~~

~~These general safety standards specify requirements for general product types or product families in order to reduce the risk of fire, electric shock or injury to the user. The product types do not include measuring relays and protection equipment. These standards also take into account single fault conditions.~~

~~Reference to all these various standards created confusion due to conflicting requirements, for example, different clearances, creepage distances and test voltages etc., for the same rated voltages.~~

~~The aim of this standard is:~~

- ~~• to remove confusion due to conflicting requirements between existing standards;~~
- ~~• to achieve a uniform approach throughout the international industry for measuring relays and protection equipment.~~

~~This product safety standard for measuring relays and protection equipment takes the general product safety standards and IEC 60664-1 as the base, defining those issues specific to measuring relays and protection equipment.~~

This document specifies the safety requirements that are generally applicable to all equipment within its scope. These requirements may be supplemented by general product safety standards and IEC 60664-1.

## MEASURING RELAYS AND PROTECTION EQUIPMENT –

### Part 27: Product safety requirements

#### 1 Scope

This part of IEC 60255—~~describes~~ specifies the product safety requirements for measuring relays and protection equipment having a rated AC voltage up to 1 000 V—~~with a rated frequency up to 65 Hz~~, or a rated DC voltage up to 1 500 V. Above these limits, IEC 60664-1 is applicable for the determination of clearance, creepage distance and withstand test voltage.

This document—~~details~~ specifies essential safety requirements to minimize the risk of fire and hazards caused by electric shock or injury to the user and property. This document specifies only product safety requirements; functional performance of the equipment is not covered. **1**

~~This standard does not cover the safety requirements of installations.~~ This document covers all the ways in which the equipment—~~may~~ can be mounted and used in—~~cubicles~~ cabinets, racks and panels, ~~and also retesting~~. This document also applies to auxiliary devices such as shunts, series resistors, transformers, auxiliary control panels, display devices, etc., that are used in conjunction with measuring relays and protection equipment and are tested together.

It is possible that ancillary equipment such as network switches used in conjunction with measuring relays and protection equipment—~~may need~~ needs to comply with additional safety requirements.

~~This standard is intended to describe only product safety requirements; therefore, functional performance of the equipment is not covered.~~

~~Functional safety requirements, including EMC functional safety, are not covered by this standard. Functional safety risk analysis is not within the scope of this product safety standard.~~

This document does not specify the implementation of individual equipment, circuits and components.

~~The object of this standard is to have a comprehensive standard that covers all aspects of product safety and the related type and routine tests, for measuring relays and protection equipment.~~

This document applies to equipment designed to be safe at least under the following environmental conditions:

- indoor use;
- altitude up to 2 000 m, in accordance with IEC 60255-1;
- ~~— external operating temperature range, in accordance with IEC 60255-1;~~
- rated ambient temperature range, in accordance with IEC 60255-1;
- maximum external relative humidity—~~95 %, non-condensing~~, in accordance with IEC 60255-1;
- ~~— supply fluctuations in accordance with IEC 60255-1;~~
- operating range of auxiliary energizing voltage in accordance with IEC 60255-1;
- applicable—~~supply~~ overvoltage category;
- ~~— external pollution degree 1 and external pollution degree 2.~~

- applicable pollution degree of the intended environment (pollution degree 2 in most cases).

~~The equipment will normally be installed in a restricted access area within a power station, substation or industrial/retail environment. The environmental conditions specified for the equipment in IEC 60255-1 apply. This standard considers the normal environmental conditions of corrosion caused by humidity but does not cover corrosion by atmospheric pollution.~~

~~It is assumed that access to the equipment during installation, maintenance, normal service and decommissioning is restricted to users aware of working procedures necessary to ensure safety.~~

~~This product safety standard takes precedence over general standards for matters of safety.~~

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~IEC 60050 (all parts), International Electrotechnical Vocabulary (available at <<http://www.electropedia.org>>~~

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60127-1, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60255-1, *Measuring relays and protection equipment – Part 1: Common requirements*

~~IEC 60255-21-1, Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section One: Vibration tests (sinusoidal)~~

~~IEC 60255-21-2, Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section Two: Shock and bump tests~~

~~IEC 60255-21-3, Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 3: Seismic tests~~

IEC 60255-26:2013, *Measuring relays and protection equipment – Part 26: Electromagnetic compatibility requirements*

IEC 60352-1, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

IEC 60352-2, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60417, *Graphical symbols for use on equipment*. Available at: <http://www.graphical-symbols.info/equipment>

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:~~2007~~2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60664-3:~~2003~~, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*  
~~Amendment 1:2010~~

IEC TS 60695-2-20, *Fire hazard testing – Part 2-20: Glowing/hot-wire based test methods – Hot-wire coil-~~ignitability~~ test method – Apparatus, test method and guidance*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60990:~~1999~~2016, *Methods of measurement of touch current and protective conductor current*

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*  
IEC 61010-1:2010/AMD1:2016

IEC 61032, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61051-2:2021, *Varistors for use in electronic equipment – Part 2: Sectional specification for surge suppression varistors*

~~IEC 61140, Protection against electric shock – Common aspects for installation and equipment~~

IEC 61180, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*

~~IEC 61180-1:1992, High-voltage test techniques for low-voltage equipment – Part 1: Definitions, test and procedure requirements~~

~~IEC 61180-2, High-voltage test techniques for low-voltage equipment – Part 2: test equipment~~

IEC 61869-6, *Instrument transformers – Part 6: Additional general requirements for low-power instrument transformers*

IEC 61869-10, *Instrument transformers – Part 10: Additional requirements for low-power passive current transformers*

IEC 61869-11, *Instrument transformers – Part 11: Additional requirements for low-power passive voltage transformers*

IEC 62151, *Safety of equipment electrically connected to a telecommunication network*

~~ISO 7000, Graphical symbols for use on equipment – Index and synopsis. Available at: <http://www.graphical-symbols.info/equipment>~~

### 3 Terms and definitions

~~For the purposes of this document, the terms and definitions given in IEC 60664-1 and IEC 60050-151-448 as well as the following apply.~~